<110> Hastings, et al.

<120> Novel Hyaluronan-Binding Proteins and Encoding Genes

<130> PF487

<140> 09/466,778
<141> 1999-12-20

<150> 60/113,871
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ggccacgcag acaggccggg tgttcctgca gctgagggtc gccgtggcc atg atg gac 178
                                                          Met Met Asp
                                                            1

cag ggc tgc cgg gaa atc ctt acc aca gcg ggc cct ttc acc gtg ctg   226
Gln Gly Cys Arg Glu Ile Leu Thr Thr Ala Gly Pro Phe Thr Val Leu
        5   10   15

gtg cca tcc gtc tcc tcc ttc tcc tcc agg acc atg aat gca tcc ctt   274
Val Pro Ser Val Ser Ser Phe Ser Ser Arg Thr Met Asn Ala Ser Leu
 20   25   30   35

gcc cag cag ctc tgt aga cag cac atc atc gca ggg cag cac atc ctg   322
Ala Gln Gln Leu Cys Arg Gln His Ile Ile Ala Gly Gln His Ile Leu
                40   45   50

gag gac aca agg acc caa caa aca cga agg tgg tgg acg ctg gcc ggg   370
Glu Asp Thr Arg Thr Gln Gln Thr Arg Arg Trp Trp Thr Leu Ala Gly
                55   60   65

cag gag atc acc gtc acc ttt aac caa ttc acg aaa tac tcc tac aag   418
Gln Glu Ile Thr Val Thr Phe Asn Gln Phe Thr Lys Tyr Ser Tyr Lys
            70   75   80

tac aaa gac cag ccc cag cag acg ttc aac atc tac aag gcc aac aac   466
Tyr Lys Asp Gln Pro Gln Gln Thr Phe Asn Ile Tyr Lys Ala Asn Asn
        85   90   95

ata gca gct aat ggc gtc ttc cac gtg gtc act ggc ctg cgg tgg cag   514
Ile Ala Ala Asn Gly Val Phe His Val Val Thr Gly Leu Arg Trp Gln
100   105   110   115

gcc ccc tct ggg acc cct ggg gat ccc aag aga act atc gga cag atc   562
Ala Pro Ser Gly Thr Pro Gly Asp Pro Lys Arg Thr Ile Gly Gln Ile
                120   125   130

ctc gcc tct acc gag gcc ttc agc cgc ttt gaa acc atc ctg gag aac   610
Leu Ala Ser Thr Glu Ala Phe Ser Arg Phe Glu Thr Ile Leu Glu Asn
                135   140   145

tgt ggg ctg ccc tcc atc ctg gac gga cct ggg ccc ttc aca gtc ttt   658
Cys Gly Leu Pro Ser Ile Leu Asp Gly Pro Gly Pro Phe Thr Val Phe
        150   155   160

gcc cca agc aat gag gct gtg gac agc ttg cgt gac ggc cgc ctg atc   706
Ala Pro Ser Asn Glu Ala Val Asp Ser Leu Arg Asp Gly Arg Leu Ile
        165   170   175

tac ctc ttc aca gcg ggt ctc tct aaa ctg cag gag ttg gtg cgg tac   754

2

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Tyr Leu Phe Thr Ala Gly Leu Ser Lys Leu Gln Glu Leu Val Arg Tyr
180               185           190           195

cac atc tac aac cac ggc cag ctg acc gtt gag aag ctc atc tcc aag      802
His Ile Tyr Asn His Gly Gln Leu Thr Val Glu Lys Leu Ile Ser Lys
                200           205           210

ggt cgg atc ctc acc atg gcg aac cag gtc ctg gct gtg aac att tct      850
Gly Arg Ile Leu Thr Met Ala Asn Gln Val Leu Ala Val Asn Ile Ser
            215           220           225

gag gag ggg cgc atc ctg ctg gga ccc gag ggg gtc ccg ctg cag agg      898
Glu Glu Gly Arg Ile Leu Leu Gly Pro Glu Gly Val Pro Leu Gln Arg
        230           235           240

gta gac gtg atg gcc gcc aat ggc gtg atc cac atg ctg gac ggc atc      946
Val Asp Val Met Ala Ala Asn Gly Val Ile His Met Leu Asp Gly Ile
    245           250           255

ctg ctg ccc ccg acc atc ctg ccc atc ctg ccc aag cac tgc agc gag      994
Leu Leu Pro Pro Thr Ile Leu Pro Ile Leu Pro Lys His Cys Ser Glu
260           265           270           275

gag cag cac aag att gtg gcg ggc tcc tgt gtg gac tgc caa gcc ctg     1042
Glu Gln His Lys Ile Val Ala Gly Ser Cys Val Asp Cys Gln Ala Leu
            280           285           290

aac acc agc acg tgt ccc ccc aac agt gtg aag ctg gac atc ttc ccc     1090
Asn Thr Ser Thr Cys Pro Pro Asn Ser Val Lys Leu Asp Ile Phe Pro
            295           300           305

aag gag tgt gtc tac atc cat gac cca acg ggg ctc aat gtg cta aag     1138
Lys Glu Cys Val Tyr Ile His Asp Pro Thr Gly Leu Asn Val Leu Lys
        310           315           320

aag ggc tgt gcc agc tac tgc aac caa acc atc atg gaa caa ggc tgc     1186
Lys Gly Cys Ala Ser Tyr Cys Asn Gln Thr Ile Met Glu Gln Gly Cys
        325           330           335

tgc aaa ggt ttt ttc ggg cct gac tgc acg cag tgt cct ggg ggc ttc     1234
Cys Lys Gly Phe Phe Gly Pro Asp Cys Thr Gln Cys Pro Gly Gly Phe
340           345           350           355

tcc aac ccc tgc tat ggc aaa ggc aat tgc agt gat ggg atc cag ggc     1282
Ser Asn Pro Cys Tyr Gly Lys Gly Asn Cys Ser Asp Gly Ile Gln Gly
            360           365           370

aat ggg gcc tgc ctc tgc ttc cca gac tac aag ggc atc gcc tgc cac     1330
Asn Gly Ala Cys Leu Cys Phe Pro Asp Tyr Lys Gly Ile Ala Cys His
            375           380           385

atc tgc tcg aac cca aac aag cat gga gag caa tgc cag gaa gac tgc     1378
Ile Cys Ser Asn Pro Asn Lys His Gly Glu Gln Cys Gln Glu Asp Cys
        390           395           400

ggc tgt gtc cat ggt ctc tgc gac aac cgc cca ggc agt ggg ggg gtg     1426
Gly Cys Val His Gly Leu Cys Asp Asn Arg Pro Gly Ser Gly Gly Val
    405           410           415

tgc cag cag ggc acg tgt gcc cct ggc ttc agt ggc cgg ttc tgc aac     1474
Cys Gln Gln Gly Thr Cys Ala Pro Gly Phe Ser Gly Arg Phe Cys Asn
420           425           430           435

gag tcc atg ggg gac tgt ggg ccc aca ggg ctg gcc cag cac tgc cac     1522
Glu Ser Met Gly Asp Cys Gly Pro Thr Gly Leu Ala Gln His Cys His
            440           445           450

ctg cat gcc cgc tgt gtt agc cag gag ggt gtt gcc aga tgt cgc tgt     1570
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3

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Leu His Ala Arg Cys Val Ser Gln Glu Gly Val Ala Arg Cys Arg Cys
        455                 460                 465

ctt gat ggc ttt gag ggt gat ggc ttc tcc tgc aca cct agc aac ccc   1618
Leu Asp Gly Phe Glu Gly Asp Gly Phe Ser Cys Thr Pro Ser Asn Pro
        470                 475                 480

tgc tcc cac ccg gac cgt gga ggc tgc tca gag aat gct gag tgt gtc   1666
Cys Ser His Pro Asp Arg Gly Gly Cys Ser Glu Asn Ala Glu Cys Val
        485                 490                 495

cct ggg tcc ctg ggc acc cac cac tgc aca tgc cac aaa ggc tgg agt   1714
Pro Gly Ser Leu Gly Thr His His Cys Thr Cys His Lys Gly Trp Ser
500                 505                 510                 515

ggg gat ggc cgc gtc tgt gtg gct att gac gag tgt gag ctg gac gtg   1762
Gly Asp Gly Arg Val Cys Val Ala Ile Asp Glu Cys Glu Leu Asp Val
                520                 525                 530

aga ggt ggc tgc cac acc gat gcc ctc tgc agc tat gtg ggc ccc ggg   1810
Arg Gly Gly Cys His Thr Asp Ala Leu Cys Ser Tyr Val Gly Pro Gly
                535                 540                 545

cag agc cga tgc acc tgc aag ctg ggc ttt gcc ggg gat ggc tac cag   1858
Gln Ser Arg Cys Thr Cys Lys Leu Gly Phe Ala Gly Asp Gly Tyr Gln
                550                 555                 560

tgc agc ccc atc gac ccc tgc cgg gca ggc aat ggc ggc tgc cac ggc   1906
Cys Ser Pro Ile Asp Pro Cys Arg Ala Gly Asn Gly Gly Cys His Gly
        565                 570                 575

ctg gag ctg gag gca aat gcc cac ttc tcc atc ttc tac caa tgg ctt   1954
Leu Glu Leu Glu Ala Asn Ala His Phe Ser Ile Phe Tyr Gln Trp Leu
580                 585                 590                 595

aag agt gcc ggc atc acg ctt cct gcc gac cgc cga gtc aca gcc ctg   2002
Lys Ser Ala Gly Ile Thr Leu Pro Ala Asp Arg Arg Val Thr Ala Leu
                600                 605                 610

gtg ccc tcc gag gct gca gtc cgt cag ctg agc ccc gag gac cga gct   2050
Val Pro Ser Glu Ala Ala Val Arg Gln Leu Ser Pro Glu Asp Arg Ala
                615                 620                 625

ttc tgg ctg cag cca agg acg ctg ccg aac ctg gtc agg gcc cat ttt   2098
Phe Trp Leu Gln Pro Arg Thr Leu Pro Asn Leu Val Arg Ala His Phe
                630                 635                 640

ctc cag ggt gcc ctc ttc gag gag gag ctg gcc cgg ctg ggt ggg cag   2146
Leu Gln Gly Ala Leu Phe Glu Glu Glu Leu Ala Arg Leu Gly Gly Gln
        645                 650                 655

gaa gtg gcc acc ctg aac ccc acc aca cgc tgg gag att cgc aac att   2194
Glu Val Ala Thr Leu Asn Pro Thr Thr Arg Trp Glu Ile Arg Asn Ile
660                 665                 670                 675

agt ggg agg gtc tgg gtg cag aat gcc agc gtg gat gtg gct gac ctc   2242
Ser Gly Arg Val Trp Val Gln Asn Ala Ser Val Asp Val Ala Asp Leu
                680                 685                 690

ctt gcc acc aac ggt gtc cta cac atc ctc agc cag gtc tta ctg ccc   2290
Leu Ala Thr Asn Gly Val Leu His Ile Leu Ser Gln Val Leu Leu Pro
                695                 700                 705

ccc cga ggg gat gtg ccc ggt ggg cag ggg ttg ctg cag cag ctg gac   2338
Pro Arg Gly Asp Val Pro Gly Gly Gln Gly Leu Leu Gln Gln Leu Asp
                710                 715                 720

ttg gtg cct gcc ttc agc ctc ttc cgg gaa ttg ctg cag cac cat ggg   2386
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4

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          Leu Val Pro Ala Phe Ser Leu Phe Arg Glu Leu Leu Gln His His Gly
              725                 730                 735

ttg gtg ccc cag att gag gct gcc act gcc tac acc atc ttt gtg ccc    2434
Leu Val Pro Gln Ile Glu Ala Ala Thr Ala Tyr Thr Ile Phe Val Pro
740                 745                 750                 755

acc aac cgc tcc ctg gag gcc cag ggc aac agc agt cac ctg gac gca    2482
Thr Asn Arg Ser Leu Glu Ala Gln Gly Asn Ser Ser His Leu Asp Ala
                    760                 765                 770

gac aca gtg cgg cac cat gtg gtc ctg ggg gag gcc ctc tcc atg gaa    2530
Asp Thr Val Arg His His Val Val Leu Gly Glu Ala Leu Ser Met Glu
                775             780                 785

acc ctg cgg aag ggt gga cac cgc aac tcc ctc ctg ggc cct gcc cac    2578
Thr Leu Arg Lys Gly Gly His Arg Asn Ser Leu Leu Gly Pro Ala His
            790                 795                 800

tgg atc gtc ttc tac aac cac agt ggc cag cct gag gtg aac cat gtg    2626
Trp Ile Val Phe Tyr Asn His Ser Gly Gln Pro Glu Val Asn His Val
            805                 810                 815

cca ctg gaa ggc ccc atg ctg gag gcc cct ggc cgc tcg ctg att ggt    2674
Pro Leu Glu Gly Pro Met Leu Glu Ala Pro Gly Arg Ser Leu Ile Gly
820                 825                 830                 835

ctg tcg ggg gtc ctg acg gtg ggc tca agt cgc tgc ctg cat agc cac    2722
Leu Ser Gly Val Leu Thr Val Gly Ser Ser Arg Cys Leu His Ser His
                840                 845                 850

gct gag gcc ctg cgg gag aaa tgt gta aac tgc acc agg aga ttc cgc    2770
Ala Glu Ala Leu Arg Glu Lys Cys Val Asn Cys Thr Arg Arg Phe Arg
                855                 860                 865

tgc act cag ggc ttc cag ctg cag gac aca ccc agg aag agc tgt gtc    2818
Cys Thr Gln Gly Phe Gln Leu Gln Asp Thr Pro Arg Lys Ser Cys Val
            870                 875                 880

tac cga tct ggc ttc tcc ttc tcc cgg ggc tgc tct tac aca tgt gcc    2866
Tyr Arg Ser Gly Phe Ser Phe Ser Arg Gly Cys Ser Tyr Thr Cys Ala
            885                 890                 895

aag aag atc cag gtg ccg gac tgc tgc cct ggt ttc ttt ggc acg ctg    2914
Lys Lys Ile Gln Val Pro Asp Cys Cys Pro Gly Phe Phe Gly Thr Leu
900                 905                 910                 915

tgt gag cca tgc cca ggg ggt cta ggg ggg gtg tgc tca ggc cat ggg    2962
Cys Glu Pro Cys Pro Gly Gly Leu Gly Gly Val Cys Ser Gly His Gly
                920                 925                 930

cag tgc cag gac agg ttc ctg ggc agc ggg gag tgc cac tgc cac gag    3010
Gln Cys Gln Asp Arg Phe Leu Gly Ser Gly Glu Cys His Cys His Glu
                935                 940                 945

ggc ttc cat gga acg gcc tgt gag gtg tgt gag ctg ggc cgc tac ggg    3058
Gly Phe His Gly Thr Ala Cys Glu Val Cys Glu Leu Gly Arg Tyr Gly
            950                 955                 960

ccc aac tgc acc gga gtg tgt gac tgt gcc cat ggg ctg tgc cag gag    3106
Pro Asn Cys Thr Gly Val Cys Asp Cys Ala His Gly Leu Cys Gln Glu
            965                 970                 975

ggg ctg caa ggg gac gga agc tgt gtc tgt aac gtg ggc tgg cag ggc    3154
Gly Leu Gln Gly Asp Gly Ser Cys Val Cys Asn Val Gly Trp Gln Gly
980                 985                 990                 995

ctc cgc tgt gac cag aaa atc acc agc cct cag tgc cct agg aag tgc    3202
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5

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Leu Arg Cys Asp Gln Lys Ile Thr Ser Pro Gln Cys Pro Arg Lys Cys
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gac ccc aat gcc aac tgc gtg cag gac tcg gcc gga gcc tcc acc tgc     3250
Asp Pro Asn Ala Asn Cys Val Gln Asp Ser Ala Gly Ala Ser Thr Cys
          1015                1020                1025

gcc tgt gct gcg gga tac tcc ggc aat ggc atc ttc tgt tca gag gtg     3298
Ala Cys Ala Ala Gly Tyr Ser Gly Asn Gly Ile Phe Cys Ser Glu Val
          1030                1035                1040

gac ccc tgc gcc cac ggc cat ggg ggc tgc tcc cct cat gcc aac tgt     3346
Asp Pro Cys Ala His Gly His Gly Gly Cys Ser Pro His Ala Asn Cys
       1045                1050                1055

acc aag gtg gca cct ggg cag cgg aca tgc acc tgc cag gat ggc tac     3394
Thr Lys Val Ala Pro Gly Gln Arg Thr Cys Thr Cys Gln Asp Gly Tyr
1060                1065                1070                1075

atg ggc gac ggg gag ctg tgc cag gaa att aac agc tgt ctc atc cac     3442
Met Gly Asp Gly Glu Leu Cys Gln Glu Ile Asn Ser Cys Leu Ile His
          1080                1085                1090

cac ggg ggc tgc cac att cac gcc gag tgc atc ccc act ggc ccc cag     3490
His Gly Gly Cys His Ile His Ala Glu Cys Ile Pro Thr Gly Pro Gln
          1095                1100                1105

cag gtc tcc tgc agc tgc cgt gag ggt tac agc ggg gat ggc atc cgg     3538
Gln Val Ser Cys Ser Cys Arg Glu Gly Tyr Ser Gly Asp Gly Ile Arg
          1110                1115                1120

acc tgc gag ctc ctg gac ccc tgc tct aag aac aat gga gga tgc agc     3586
Thr Cys Glu Leu Leu Asp Pro Cys Ser Lys Asn Asn Gly Gly Cys Ser
       1125                1130                1135

cca tat gcc acc tgc aaa agc aca ggg gat ggc cag agg aca tgt acc     3634
Pro Tyr Ala Thr Cys Lys Ser Thr Gly Asp Gly Gln Arg Thr Cys Thr
1140                1145                1150                1155

tgc gac aca gcc cac acc gtg ggg gac ggc ctc acc tgc cgt gcc cga     3682
Cys Asp Thr Ala His Thr Val Gly Asp Gly Leu Thr Cys Arg Ala Arg
          1160                1165                1170

gtc ggc ctg gag ctc ctg agg gat aag cat gcc tca ttc ttc agc ctc     3730
Val Gly Leu Glu Leu Leu Arg Asp Lys His Ala Ser Phe Phe Ser Leu
          1175                1180                1185

cgc ctc ctg gaa tat aag gag ctc aag ggc gat ggg cct ttc acc atc     3778
Arg Leu Leu Glu Tyr Lys Glu Leu Lys Gly Asp Gly Pro Phe Thr Ile
          1190                1195                1200

ttc gtg ccg cac gca gat cta atg agc aac ctg tcg cag gat gag ctg     3826
Phe Val Pro His Ala Asp Leu Met Ser Asn Leu Ser Gln Asp Glu Leu
          1205                1210                1215

gcc cgg att cgt gcg cat cgc cag ctg gtg ttt cgc tac cac gtg gtt     3874
Ala Arg Ile Arg Ala His Arg Gln Leu Val Phe Arg Tyr His Val Val
1220                1225                1230                1235

ggc tgt cgg cgg ctg cgg agc gag gac ctg ctg gag cag ggg tac gcc     3922
Gly Cys Arg Arg Leu Arg Ser Glu Asp Leu Leu Glu Gln Gly Tyr Ala
          1240                1245                1250

acg gcc ctc tca ggg cac cca ctg cgc ttc agc gag agg gag ggc agc     3970
Thr Ala Leu Ser Gly His Pro Leu Arg Phe Ser Glu Arg Glu Gly Ser
          1255                1260                1265

ata tac ctc aat gac ttc gcg cgc gtg gtg agc agc gac cat gag gcc     4018
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6

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            Ile Tyr Leu Asn Asp Phe Ala Arg Val Val Ser Ser Asp His Glu Ala
                 1270                1275                1280

            gtg aac ggc atc ctg cac ttc att gac cgt gtc ctg ctg ccc ccc gag    4066
            Val Asn Gly Ile Leu His Phe Ile Asp Arg Val Leu Leu Pro Pro Glu
                 1285                1290                1295

            gcg ctg cac tgg gag cct gat gat gct ccc atc ccg agg aga aat gtc    4114
            Ala Leu His Trp Glu Pro Asp Asp Ala Pro Ile Pro Arg Arg Asn Val
            1300                1305                1310                1315

            acc gcc gcc gcc cag ggc ttc ggt tac aag atc ttc agc ggc ctc ctg    4162
            Thr Ala Ala Ala Gln Gly Phe Gly Tyr Lys Ile Phe Ser Gly Leu Leu
                 1320                1325                1330

            aag gtg gcc ggc ctc ctg ccc ctg ctt cga gag gca tcc cat agg ccc    4210
            Lys Val Ala Gly Leu Leu Pro Leu Leu Arg Glu Ala Ser His Arg Pro
                 1335                1340                1345

            ttc aca atg ctg tgg ccc aca gac gcc gcc ttt cga gct ctg cct ccg    4258
            Phe Thr Met Leu Trp Pro Thr Asp Ala Ala Phe Arg Ala Leu Pro Pro
                 1350                1355                1360

            gat cgc cag gcc tgg ctg tac cat gag gac cac cgt gac aag cta gca    4306
            Asp Arg Gln Ala Trp Leu Tyr His Glu Asp His Arg Asp Lys Leu Ala
                 1365                1370                1375

            gcc att ctg cgg ggc cac atg att cgc aat gtc gag gcc ttg gca tct    4354
            Ala Ile Leu Arg Gly His Met Ile Arg Asn Val Glu Ala Leu Ala Ser
            1380                1385                1390                1395

            gac ctg ccc aac ctg ggc cca ctt cga acc atg cat ggg acc ccc atc    4402
            Asp Leu Pro Asn Leu Gly Pro Leu Arg Thr Met His Gly Thr Pro Ile
                 1400                1405                1410

            tct ttc tcc tgc agc cga acg cgg ccc ggt gag ctc atg gtg ggt gag    4450
            Ser Phe Ser Cys Ser Arg Thr Arg Pro Gly Glu Leu Met Val Gly Glu
                 1415                1420                1425

            gat gat gct cgc att gtg cag cgg cac ttg ccc ttt gag ggt ggc ctg    4498
            Asp Asp Ala Arg Ile Val Gln Arg His Leu Pro Phe Glu Gly Gly Leu
                 1430                1435                1440

            gcc tat ggc atc gac cag ctg ctg gag cca cct ggc ctt ggt gct cgc    4546
            Ala Tyr Gly Ile Asp Gln Leu Leu Glu Pro Pro Gly Leu Gly Ala Arg
                 1445                1450                1455

            tgt gac cac ttt gag acc cgg ccc ctg cga ctg aac acc tgc agc atc    4594
            Cys Asp His Phe Glu Thr Arg Pro Leu Arg Leu Asn Thr Cys Ser Ile
            1460                1465                1470                1475

            tgt ggg ctg gag cca ccc tgt cct gag ggg tca cag gag cag ggc agc    4642
            Cys Gly Leu Glu Pro Pro Cys Pro Glu Gly Ser Gln Glu Gln Gly Ser
                 1480                1485                1490

            cct gag gcc tgc tgg cgc ttc tac ccg aag ttc tgg acg tcc cct ccg    4690
            Pro Glu Ala Cys Trp Arg Phe Tyr Pro Lys Phe Trp Thr Ser Pro Pro
                 1495                1500                1505

            ctg cac tct ttg gga tta cgc agc gtc tgg gtc cac ccc agc ctt tgg    4738
            Leu His Ser Leu Gly Leu Arg Ser Val Trp Val His Pro Ser Leu Trp
                 1510                1515                1520

            ggt agg ccc caa ggc ctg ggc agg ggc tgc cac cgc aat tgt gtc acc    4786
            Gly Arg Pro Gln Gly Leu Gly Arg Gly Cys His Arg Asn Cys Val Thr
                 1525                1530                1535

            acc acc tgg aag ccc agc tgc tgc cct ggt cac tat ggc agt gag tgc    4834
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7

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Thr Thr Trp Lys Pro Ser Cys Cys Pro Gly His Tyr Gly Ser Glu Cys
1540            1545            1550            1555


caa gct tgc cct ggc ggc ccc agc agc cct tgt agt gac cgt ggc gtg    4882
Gln Ala Cys Pro Gly Gly Pro Ser Ser Pro Cys Ser Asp Arg Gly Val
            1560            1565            1570


tgc atg gac ggc atg agt ggc agt ggg cag tgt ctg tgc cgt tca ggt    4930
Cys Met Asp Gly Met Ser Gly Ser Gly Gln Cys Leu Cys Arg Ser Gly
        1575            1580            1585


ttt gct ggg aca gcc tgt gaa ctc tgt gct cct ggt gcc ttt ggg ccc    4978
Phe Ala Gly Thr Ala Cys Glu Leu Cys Ala Pro Gly Ala Phe Gly Pro
    1590            1595            1600


cat tgt caa gcc tgc cgc tgc act gtg cat ggc cgc tgt gat gag ggc    5026
His Cys Gln Ala Cys Arg Cys Thr Val His Gly Arg Cys Asp Glu Gly
    1605            1610            1615


ctt ggg ggc tct ggc tcc tgc ttc tgt gat gaa ggc tgg act ggg cca    5074
Leu Gly Gly Ser Gly Ser Cys Phe Cys Asp Glu Gly Trp Thr Gly Pro
1620            1625            1630            1635


cgc tgt gag gtg caa ctg gag ctg cag cct gtg tgt acc cca ccc tgt    5122
Arg Cys Glu Val Gln Leu Glu Leu Gln Pro Val Cys Thr Pro Pro Cys
            1640            1645            1650


gca ccc gag gct gtg tgc cgt gca ggc aac agc tgt gag tgc agc ctg    5170
Ala Pro Glu Ala Val Cys Arg Ala Gly Asn Ser Cys Glu Cys Ser Leu
            1655            1660            1665


ggc tat gaa ggg gat ggc cgt gtg tgt aca gtg gca gac ctg tgc cag    5218
Gly Tyr Glu Gly Asp Gly Arg Val Cys Thr Val Ala Asp Leu Cys Gln
        1670            1675            1680


gac ggg cat ggt ggc tgc agt gag cac gcc aac tgt agc cag gta gga    5266
Asp Gly His Gly Gly Cys Ser Glu His Ala Asn Cys Ser Gln Val Gly
    1685            1690            1695


aca atg gtc act tgt acc tgc ctg ccc gac tac gag ggt gat ggc tgg    5314
Thr Met Val Thr Cys Thr Cys Leu Pro Asp Tyr Glu Gly Asp Gly Trp
1700            1705            1710            1715


agc tgc cgg gcc cgc aac ccc tgc aca gat ggc cac cgc ggg ggc tgc    5362
Ser Cys Arg Ala Arg Asn Pro Cys Thr Asp Gly His Arg Gly Gly Cys
            1720            1725            1730


agc gag cac gcc aac tgc ttg agc acc ggc ctg aac aca cgg cgc tgt    5410
Ser Glu His Ala Asn Cys Leu Ser Thr Gly Leu Asn Thr Arg Arg Cys
        1735            1740            1745


gag tgc cac gca ggc tac gta ggc gat gga ctg cag tgt ctg gag gag    5458
Glu Cys His Ala Gly Tyr Val Gly Asp Gly Leu Gln Cys Leu Glu Glu
        1750            1755            1760


tcg gaa cca cct gtg gac cgc tgc ttg ggc cag cca ccg ccc tgc cac    5506
Ser Glu Pro Pro Val Asp Arg Cys Leu Gly Gln Pro Pro Pro Cys His
    1765            1770            1775


tca gat gcc atg tgc act gac ctg cac ttc cag gag aaa cgg gct ggc    5554
Ser Asp Ala Met Cys Thr Asp Leu His Phe Gln Glu Lys Arg Ala Gly
1780            1785            1790            1795


gtt ttc cac ctc cag gcc acc agc ggc cct tat ggt ctg aac ttt tcg    5602
Val Phe His Leu Gln Ala Thr Ser Gly Pro Tyr Gly Leu Asn Phe Ser
            1800            1805            1810


gag gct gag gcg gca tgc gaa gca cag gga gcc gtc ctt gct tca ttc    5650
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8

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         Glu Ala Glu Ala Ala Cys Glu Ala Gln Gly Ala Val Leu Ala Ser Phe
                 1815              1820              1825

cct cag ctc tct gct gcc cag cag ctg ggc ttc cac ctg tgc ctc atg    5698
Pro Gln Leu Ser Ala Ala Gln Gln Leu Gly Phe His Leu Cys Leu Met
        1830              1835              1840

ggc tgg ctg gcc aat ggc tcc act gcc cac cct gtg gtt ttc cct gtg    5746
Gly Trp Leu Ala Asn Gly Ser Thr Ala His Pro Val Val Phe Pro Val
     1845              1850              1855

gcg gac tgt ggc aat ggt cgg gtg ggc ata gtc agc ctg ggt gcc cgc    5794
Ala Asp Cys Gly Asn Gly Arg Val Gly Ile Val Ser Leu Gly Ala Arg
1860              1865              1870              1875

aag aac ctc tca gaa cgc tgg gat gcc tac tgc ttc cgt gtg caa gat    5842
Lys Asn Leu Ser Glu Arg Trp Asp Ala Tyr Cys Phe Arg Val Gln Asp
             1880              1885              1890

gtg gcc tgc cga tgc cga aat ggc ttc gtg ggt gac ggg atc agc acg    5890
Val Ala Cys Arg Cys Arg Asn Gly Phe Val Gly Asp Gly Ile Ser Thr
        1895              1900              1905

tgc aat ggg aag ctg ctg gat gtg ctg gct gcc act gcc·aac ttc tcc    5938
Cys Asn Gly Lys Leu Leu Asp Val Leu Ala Ala Thr Ala Asn Phe Ser
        1910              1915              1920

acc ttc tat ggg atg cta ttg ggc tat gcc aat gcc acc cag cgg ggt    5986
Thr Phe Tyr Gly Met Leu Leu Gly Tyr Ala Asn Ala Thr Gln Arg Gly
     1925              1930              1935

ctc gac ttc ctg gac ttc ctg gat gat gag ctc acg tat aag aca ctc    6034
Leu Asp Phe Leu Asp Phe Leu Asp Asp Glu Leu Thr Tyr Lys Thr Leu
1940              1945              1950              1955

ttc gtc cct gtc aat gaa ggc ttt gtg gac aac atg acg ctg agt ggc    6082
Phe Val Pro Val Asn Glu Gly Phe Val Asp Asn Met Thr Leu Ser Gly
             1960              1965              1970

cca aac ttg gag ctg cat gcc tcc aac gcc acc ctc cta agt gcc aac    6130
Pro Asn Leu Glu Leu His Ala Ser Asn Ala Thr Leu Leu Ser Ala Asn
             1975              1980              1985

gcc agc cag ggg aag ttg ctt ccg gcc cac tca ggc ctc agc ctc atc    6178
Ala Ser Gln Gly Lys Leu Leu Pro Ala His Ser Gly Leu Ser Leu Ile
        1990              1995              2000

atc agt gac gca ggc cct gac aac agt tcc tgg gcc cct gtg gcc cca    6226
Ile Ser Asp Ala Gly Pro Asp Asn Ser Ser Trp Ala Pro Val Ala Pro
   2005              2010              2015

ggg aca gtt gtg gtt agc cgt atc att gtg tgg gac atc atg gcc ttc    6274
Gly Thr Val Val Val Ser Arg Ile Ile Val Trp Asp Ile Met Ala Phe
2020              2025              2030              2035

aat ggc atc atc cat gct ctg gcc agc ccc ctc ctg gca ccc cca cag    6322
Asn Gly Ile Ile His Ala Leu Ala Ser Pro Leu Leu Ala Pro Pro Gln
             2040              2045              2050

ccc cag gca gtg ctg gcg cnt gaa gcc cca cct gtg gcg gca ggc gtg    6370
Pro Gln Ala Val Leu Ala Xaa Glu Ala Pro Pro Val Ala Ala Gly Val
        2055              2060              2065

ggg gct gtg ctt gcc gct gga gca ctg ctt ggc ttg gtg gcc gga gct    6418
Gly Ala Val Leu Ala Ala Gly Ala Leu Leu Gly Leu Val Ala Gly Ala
        2070              2075              2080

ctc tac ctc cgt gcc cga ggc aag ccc atg ggc ttt ggc ttc tct gcc    6466
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9

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Leu Tyr Leu Arg Ala Arg Gly Lys Pro Met Gly Phe Gly Phe Ser Ala
   2085                 2090                 2095

ttc cag gcg gaa gat gat gct gat gac gan ttc tca ccg tgg caa gaa   6514
Phe Gln Ala Glu Asp Asp Ala Asp Asp Xaa Phe Ser Pro Trp Gln Glu
2100                 2105                 2110                 2115

ggg acc aac ccc acn ttg gtn tnt gtc ccc aac cct gtc ttt ggc agc   6562
Gly Thr Asn Pro Xaa Leu Xaa Xaa Val Pro Asn Pro Val Phe Gly Ser
                2120                 2125                 2130

gac acc ttt tgt gaa ccc ttc gat gac tca ctg ctg gag gag gac ttc   6610
Asp Thr Phe Cys Glu Pro Phe Asp Asp Ser Leu Leu Glu Glu Asp Phe
            2135                 2140                 2145

cct gac acc cag agg atc ctc aca gtc aag tga cgaggctggg gctgaaagca 6663
Pro Asp Thr Gln Arg Ile Leu Thr Val Lys
        2150                 2155

gaagcatgca cagggaggag accantttta ttgcttgtct gggtggatgg ggcaggaggg 6723

nctgagggcc tgtcccagac aatannngtn ccctcgag                         6761


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Thr Val Leu Val Pro Ser Val Ser Ser Phe Ser Ser Arg Thr Met Asn
                20                 25                 30

Ala Ser Leu Ala Gln Gln Leu Cys Arg Gln His Ile Ile Ala Gly Gln
            35                 40                 45

His Ile Leu Glu Asp Thr Arg Thr Gln Gln Thr Arg Arg Trp Trp Thr
        50                 55                 60

Leu Ala Gly Gln Glu Ile Thr Val Thr Phe Asn Gln Phe Thr Lys Tyr
```

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              65                    70                    75                    80

    Ser Tyr Lys Tyr Lys Asp Gln Pro Gln Gln Thr Phe Asn Ile Tyr Lys
                     85                    90                    95

    Ala Asn Asn Ile Ala Ala Asn Gly Val Phe His Val Val Thr Gly Leu
                    100                   105                   110

    Arg Trp Gln Ala Pro Ser Gly Thr Pro Gly Asp Pro Lys Arg Thr Ile
                    115                   120                   125

    Gly Gln Ile Leu Ala Ser Thr Glu Ala Phe Ser Arg Phe Glu Thr Ile
                    130                   135                   140

    Leu Glu Asn Cys Gly Leu Pro Ser Ile Leu Asp Gly Pro Gly Pro Phe
    145                   150                   155                   160

    Thr Val Phe Ala Pro Ser Asn Glu Ala Val Asp Ser Leu Arg Asp Gly
                    165                   170                   175

    Arg Leu Ile Tyr Leu Phe Thr Ala Gly Leu Ser Lys Leu Gln Glu Leu
                    180                   185                   190

    Val Arg Tyr His Ile Tyr Asn His Gly Gln Leu Thr Val Glu Lys Leu
                    195                   200                   205

    Ile Ser Lys Gly Arg Ile Leu Thr Met Ala Asn Gln Val Leu Ala Val
        210                   215                   220

    Asn Ile Ser Glu Glu Gly Arg Ile Leu Leu Gly Pro Glu Gly Val Pro
    225                   230                   235                   240

    Leu Gln Arg Val Asp Val Met Ala Ala Asn Gly Val Ile His Met Leu
                    245                   250                   255

    Asp Gly Ile Leu Leu Pro Pro Thr Ile Leu Pro Ile Leu Pro Lys His
                    260                   265                   270

    Cys Ser Glu Glu Gln His Lys Ile Val Ala Gly Ser Cys Val Asp Cys
                    275                   280                   285

    Gln Ala Leu Asn Thr Ser Thr Cys Pro Pro Asn Ser Val Lys Leu Asp
        290                   295                   300

    Ile Phe Pro Lys Glu Cys Val Tyr Ile His Asp Pro Thr Gly Leu Asn
    305                   310                   315                   320

    Val Leu Lys Lys Gly Cys Ala Ser Tyr Cys Asn Gln Thr Ile Met Glu
                    325                   330                   335

    Gln Gly Cys Cys Lys Gly Phe Phe Gly Pro Asp Cys Thr Gln Cys Pro
                    340                   345                   350

    Gly Gly Phe Ser Asn Pro Cys Tyr Gly Lys Gly Asn Cys Ser Asp Gly
                    355                   360                   365

    Ile Gln Gly Asn Gly Ala Cys Leu Cys Phe Pro Asp Tyr Lys Gly Ile
        370                   375                   380

    Ala Cys His Ile Cys Ser Asn Pro Asn Lys His Gly Glu Gln Cys Gln
    385                   390                   395                   400

    Glu Asp Cys Gly Cys Val His Gly Leu Cys Asp Asn Arg Pro Gly Ser
                    405                   410                   415

    Gly Gly Val Cys Gln Gln Gly Thr Cys Ala Pro Gly Phe Ser Gly Arg
                    420                   425                   430
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Phe Cys Asn Glu Ser Met Gly Asp Cys Gly Pro Thr Gly Leu Ala Gln
          435   440   445

His Cys His Leu His Ala Arg Cys Val Ser Gln Glu Gly Val Ala Arg
    450   455   460

Cys Arg Cys Leu Asp Gly Phe Glu Gly Asp Gly Phe Ser Cys Thr Pro
465   470   475   480

Ser Asn Pro Cys Ser His Pro Asp Arg Gly Gly Cys Ser Glu Asn Ala
              485   490   495

Glu Cys Val Pro Gly Ser Leu Gly Thr His His Cys Thr Cys His Lys
          500   505   510

Gly Trp Ser Gly Asp Gly Arg Val Cys Val Ala Ile Asp Glu Cys Glu
        515   520   525

Leu Asp Val Arg Gly Gly Cys His Thr Asp Ala Leu Cys Ser Tyr Val
    530   535   540

Gly Pro Gly Gln Ser Arg Cys Thr Cys Lys Leu Gly Phe Ala Gly Asp
545   550   555   560

Gly Tyr Gln Cys Ser Pro Ile Asp Pro Cys Arg Ala Gly Asn Gly Gly
              565   570   575

Cys His Gly Leu Glu Leu Glu Ala Asn Ala His Phe Ser Ile Phe Tyr
          580   585   590

Gln Trp Leu Lys Ser Ala Gly Ile Thr Leu Pro Ala Asp Arg Arg Val
        595   600   605

Thr Ala Leu Val Pro Ser Glu Ala Ala Val Arg Gln Leu Ser Pro Glu
    610   615   620

Asp Arg Ala Phe Trp Leu Gln Pro Arg Thr Leu Pro Asn Leu Val Arg
625   630   635   640

Ala His Phe Leu Gln Gly Ala Leu Phe Glu Glu Glu Leu Ala Arg Leu
          645   650   655

Gly Gly Gln Glu Val Ala Thr Leu Asn Pro Thr Thr Arg Trp Glu Ile
          660   665   670

Arg Asn Ile Ser Gly Arg Val Trp Val Gln Asn Ala Ser Val Asp Val
        675   680   685

Ala Asp Leu Leu Ala Thr Asn Gly Val Leu His Ile Leu Ser Gln Val
    690   695   700

Leu Leu Pro Pro Arg Gly Asp Val Pro Gly Gly Gln Gly Leu Leu Gln
705   710   715   720

Gln Leu Asp Leu Val Pro Ala Phe Ser Leu Phe Arg Glu Leu Leu Gln
              725   730   735

His His Gly Leu Val Pro Gln Ile Glu Ala Ala Thr Ala Tyr Thr Ile
          740   745   750

Phe Val Pro Thr Asn Arg Ser Leu Glu Ala Gln Gly Asn Ser Ser His
          755   760   765

Leu Asp Ala Asp Thr Val Arg His His Val Val Leu Gly Glu Ala Leu
    770   775   780

Ser Met Glu Thr Leu Arg Lys Gly Gly His Arg Asn Ser Leu Leu Gly
785   790   795   800

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Pro Ala His Trp Ile Val Phe Tyr Asn His Ser Gly Gln Pro Glu Val
                805   810   815

Asn His Val Pro Leu Glu Gly Pro Met Leu Glu Ala Pro Gly Arg Ser
            820   825   830

Leu Ile Gly Leu Ser Gly Val Leu Thr Val Gly Ser Ser Arg Cys Leu
        835   840   845

His Ser His Ala Glu Ala Leu Arg Glu Lys Cys Val Asn Cys Thr Arg
    850   855   860

Arg Phe Arg Cys Thr Gln Gly Phe Gln Leu Gln Asp Thr Pro Arg Lys
865   870   875   880

Ser Cys Val Tyr Arg Ser Gly Phe Ser Phe Ser Arg Gly Cys Ser Tyr
            885   890   895

Thr Cys Ala Lys Lys Ile Gln Val Pro Asp Cys Cys Pro Gly Phe Phe
            900   905   910

Gly Thr Leu Cys Glu Pro Cys Pro Gly Gly Leu Gly Gly Val Cys Ser
        915   920   925

Gly His Gly Gln Cys Gln Asp Arg Phe Leu Gly Ser Gly Glu Cys His
    930   935   940

Cys His Glu Gly Phe His Gly Thr Ala Cys Glu Val Cys Glu Leu Gly
945   950   955   960

Arg Tyr Gly Pro Asn Cys Thr Gly Val Cys Asp Cys Ala His Gly Leu
            965   970   975

Cys Gln Glu Gly Leu Gln Gly Asp Gly Ser Cys Val Cys Asn Val Gly
            980   985   990

Trp Gln Gly Leu Arg Cys Asp Gln Lys Ile Thr Ser Pro Gln Cys Pro
        995   1000   1005

Arg Lys Cys Asp Pro Asn Ala Asn Cys Val Gln Asp Ser Ala Gly Ala
    1010   1015   1020

Ser Thr Cys Ala Cys Ala Ala Gly Tyr Ser Gly Asn Gly Ile Phe Cys
1025   1030   1035   1040

Ser Glu Val Asp Pro Cys Ala His Gly His Gly Gly Cys Ser Pro His
            1045   1050   1055

Ala Asn Cys Thr Lys Val Ala Pro Gly Gln Arg Thr Cys Thr Cys Gln
        1060   1065   1070

Asp Gly Tyr Met Gly Asp Gly Glu Leu Cys Gln Glu Ile Asn Ser Cys
        1075   1080   1085

Leu Ile His His Gly Gly Cys His Ile His Ala Glu Cys Ile Pro Thr
    1090   1095   1100

Gly Pro Gln Gln Val Ser Cys Ser Cys Arg Glu Gly Tyr Ser Gly Asp
1105   1110   1115   1120

Gly Ile Arg Thr Cys Glu Leu Leu Asp Pro Cys Ser Lys Asn Asn Gly
            1125   1130   1135

Gly Cys Ser Pro Tyr Ala Thr Cys Lys Ser Thr Gly Asp Gly Gln Arg
        1140   1145   1150

Thr Cys Thr Cys Asp Thr Ala His Thr Val Gly Asp Gly Leu Thr Cys

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              1155                    1160                    1165

Arg Ala  Arg Val Gly  Leu Glu  Leu Leu Arg  Asp Lys  His Ala Ser  Phe
    1170                     1175                 1180

Phe  Ser Leu Arg Leu  Leu  Glu Tyr Lys Glu  Leu  Lys Gly Asp Gly  Pro
1185                     1190                 1195                     1200

Phe Thr Ile Phe Val  Pro His Ala Asp Leu  Met Ser Asn Leu Ser  Gln
                1205                 1210                 1215

Asp Glu Leu Ala  Arg Ile Arg Ala His  Arg Gln Leu Val Phe  Arg  Tyr
            1220                 1225                 1230

His Val Val  Gly Cys Arg Arg Leu  Arg Ser Glu Asp Leu  Leu Glu  Gln
            1235                 1240                 1245

Gly Tyr  Ala Thr Ala Leu Ser  Gly His Pro Leu Arg  Phe Ser Glu  Arg
    1250                 1255                 1260

Glu  Gly Ser Ile Tyr  Leu  Asn Asp Phe Ala  Arg  Val Val Ser Ser  Asp
1265                     1270                 1275                     1280

His Glu Ala Val Asn  Gly Ile Leu His Phe  Ile Asp Arg Val Leu  Leu
                1285                 1290                 1295

Pro Pro Glu Ala  Leu His Trp Glu Pro  Asp Asp Ala Pro Ile  Pro  Arg
            1300                 1305                 1310

Arg Asn Val  Thr Ala Ala Ala Gln  Gly Phe Gly Tyr Lys  Ile Phe  Ser
            1315                 1320                 1325

Gly Leu  Leu Lys Val Ala Gly  Leu Leu Pro Leu Leu  Arg Glu Ala  Ser
    1330                 1335                 1340

His  Arg Pro Phe Thr Met  Leu Trp Pro Thr  Asp  Ala Ala Phe Arg  Ala
1345                     1350                 1355                     1360

Leu Pro Pro Asp Arg  Gln Ala Trp Leu Tyr  His Glu Asp His Arg  Asp
            1365                 1370                 1375

Lys Leu Ala Ala  Ile Leu Arg Gly His  Met Ile Arg Asn Val  Glu Ala
            1380                 1385                 1390

Leu Ala Ser  Asp Leu Pro Asn Leu  Gly Pro Leu Arg Thr  Met His  Gly
            1395                 1400                 1405

Thr Pro  Ile Ser Phe Ser Cys  Ser Arg Thr Arg Pro  Gly Glu Leu  Met
    1410                 1415                 1420

Val  Gly Glu Asp Asp Ala  Arg Ile Val Gln  Arg  His Leu Pro Phe  Glu
1425                     1430                 1435                     1440

Gly Gly Leu Ala Tyr  Gly Ile Asp Gln Leu  Leu Glu Pro Pro Gly  Leu
                1445                 1450                 1455

Gly Ala Arg Cys  Asp His Phe Glu Thr  Arg Pro Leu Arg Leu  Asn Thr
            1460                 1465                 1470

Cys Ser Ile  Cys Gly Leu Glu Pro  Pro Cys Pro Glu Gly  Ser Gln Glu
            1475                 1480                 1485

Gln Gly  Ser Pro Glu Ala Cys  Trp Arg Phe Tyr Pro  Lys Phe Trp  Thr
    1490                 1495                 1500

Ser  Pro Pro Leu His Ser  Leu Gly Leu Arg Ser  Val Trp Val His  Pro
1505                     1510                 1515                     1520
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                              14

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Ser Leu Trp Gly Arg   Pro Gln Gly Leu Gly   Arg Gly Cys His Arg   Asn
            1525                 1530                   1535

Cys Val Thr Thr   Thr Trp Lys Pro Ser   Cys Cys Pro Gly His   Tyr Gly
        1540                 1545                   1550

Ser Glu Cys   Gln Ala Cys Pro Gly   Gly Pro Ser Ser Pro   Cys Ser Asp
        1555                 1560                   1565

Arg Gly   Val Cys Met Asp Gly   Met Ser Gly Ser Gly   Gln Cys Leu Cys
        1570                 1575                   1580

Arg   Ser Gly Phe Ala   Gly   Thr Ala Cys Glu   Leu   Cys Ala Pro Gly   Ala
1585                 1590                   1595                   1600

Phe Gly Pro His Cys   Gln Ala Cys Arg Cys   Thr Val His Gly Arg   Cys
            1605                 1610                   1615

Asp Glu Gly Leu   Gly Gly Ser Gly Ser   Cys Phe Cys Asp Glu   Gly Trp
            1620                 1625                   1630

Thr Gly Pro   Arg Cys Glu Val Gln   Leu Glu Leu Gln Pro   Val Cys Thr
        1635                 1640                   1645

Pro Pro   Cys Ala Pro Glu Ala   Val Cys Arg Ala Gly   Asn Ser Cys Glu
        1650                 1655                   1660

Cys   Ser Leu Gly Tyr   Glu   Gly Asp Gly Arg   Val   Cys Thr Val Ala   Asp
1665                 1670                   1675                   1680

Leu Cys Gln Asp Gly   His Gly Gly Cys Ser   Glu His Ala Asn Cys   Ser
            1685                 1690                   1695

Gln Val Gly Thr   Met Val Thr Cys Thr   Cys Leu Pro Asp Tyr   Glu Gly
            1700                 1705                   1710

Asp Gly Trp   Ser Cys Arg Ala Arg   Asn Pro Cys Thr Asp   Gly His Arg
            1715                 1720                   1725

Gly Gly   Cys Ser Glu His Ala   Asn Cys Leu Ser Thr   Gly Leu Asn Thr
        1730                 1735                   1740

Arg   Arg Cys Glu Cys His   Ala Gly Tyr Val Gly   Asp Gly Leu Gln Cys
1745                 1750                   1755                   1760

Leu Glu Glu Ser Glu   Pro Pro Val Asp Arg   Cys Leu Gly Gln Pro   Pro
            1765                 1770                   1775

Pro Cys His Ser   Asp Ala Met Cys Thr   Asp Leu His Phe Gln   Glu Lys
        1780                 1785                   1790

Arg Ala Gly   Val Phe His Leu Gln   Ala Thr Ser Gly Pro   Tyr Gly Leu
        1795                 1800                   1805

Asn Phe   Ser Glu Ala Glu Ala   Ala Cys Glu Ala Gln   Gly Ala Val Leu
        1810                 1815                   1820

Ala   Ser Phe Pro Gln   Leu   Ser Ala Ala Gln   Gln   Leu Gly Phe His   Leu
1825                 1830                   1835                   1840

Cys Leu Met Gly Trp   Leu Ala Asn Gly Ser   Thr Ala His Pro Val   Val
            1845                 1850                   1855

Phe Pro Val Ala   Asp Cys Gly Asn Gly   Arg Val Gly Ile Val   Ser Leu
        1860                 1865                   1870

Gly Ala Arg   Lys Asn Leu Ser Glu   Arg Trp Asp Ala Tyr   Cys Phe Arg
        1875                 1880                   1885
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15

Val Gln Asp Val Ala Cys Arg Cys Arg Asn Gly Phe Val Gly Asp Gly
    1890   1895   1900

Ile Ser Thr Cys Asn Gly Lys Leu Leu Asp Val Leu Ala Ala Thr Ala
1905   1910   1915   1920

Asn Phe Ser Thr Phe Tyr Gly Met Leu Leu Gly Tyr Ala Asn Ala Thr
            1925   1930   1935

Gln Arg Gly Leu Asp Phe Leu Asp Phe Leu Asp Asp Glu Leu Thr Tyr
        1940   1945   1950

Lys Thr Leu Phe Val Pro Val Asn Glu Gly Phe Val Asp Asn Met Thr
        1955   1960   1965

Leu Ser Gly Pro Asn Leu Glu Leu His Ala Ser Asn Ala Thr Leu Leu
    1970   1975   1980

Ser Ala Asn Ala Ser Gln Gly Lys Leu Leu Pro Ala His Ser Gly Leu
1985   1990   1995   2000

Ser Leu Ile Ile Ser Asp Ala Gly Pro Asp Asn Ser Ser Trp Ala Pro
            2005   2010   2015

Val Ala Pro Gly Thr Val Val Val Ser Arg Ile Ile Val Trp Asp Ile
        2020   2025   2030

Met Ala Phe Asn Gly Ile Ile His Ala Leu Ala Ser Pro Leu Leu Ala
        2035   2040   2045

Pro Pro Gln Pro Gln Ala Val Leu Ala Xaa Glu Ala Pro Pro Val Ala
    2050   2055   2060

Ala Gly Val Gly Ala Val Leu Ala Ala Gly Ala Leu Leu Gly Leu Val
2065   2070   2075   2080

Ala Gly Ala Leu Tyr Leu Arg Ala Arg Gly Lys Pro Met Gly Phe Gly
            2085   2090   2095

Phe Ser Ala Phe Gln Ala Glu Asp Asp Ala Asp Asp Xaa Phe Ser Pro
            2100   2105   2110

Trp Gln Glu Gly Thr Asn Pro Xaa Leu Xaa Xaa Val Pro Asn Pro Val
        2115   2120   2125

Phe Gly Ser Asp Thr Phe Cys Glu Pro Phe Asp Asp Ser Leu Leu Glu
    2130   2135   2140

Glu Asp Phe Pro Asp Thr Gln Arg Ile Leu Thr Val Lys
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            20   25   30

Ala Ala Lys Ala Val Cys Gly Gly His Ala Thr Tyr Lys Ala Ala Arg
        35   40   45

16

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Lys Gly His Val Cys Ala Ala Gly Trp Met Ala Lys Gly Arg Val Gly
    50              55              60

Tyr Val Lys Gly Asn Cys Gly Gly Lys Thr Gly Asp Tyr Gly Arg Asn
65              70              75                      80

Arg Ser Arg Trp Asp Ala Tyr Cys Tyr Asn His Ala Lys Cys Gly Gly
            85              90              95

Val Thr Asp Lys Arg Lys Ser Gly Asn Tyr Asp Asn Cys Tyr Trp His
            100             105             110

Arg Lys Tyr Gly Arg His Ser Asp Asp Asp Gly Cys Ala Asp Tyr
        115             120             125

Val Tyr Asp Ser Tyr Asp Asp Val His Gly Val Gly Arg Tyr Cys Gly
    130             135             140

Asp Asp Asp Ser Thr Gly Asn Val Met Thr Lys Ser Asp Ala Ser Val
145             150             155             160

Thr Ala Gly Gly Lys Tyr Val Ala Met Asp Val Ser Lys Ser Ser Gly
            165             170             175

Lys Asn Thr Ser Thr Thr Ser Thr Gly Asn Lys Asn Ala Gly Arg Ser
            180             185             190

His


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                                     Met Val Thr Cys Thr Cys Leu Pro
                                      1               5

gac tac gag ggt gat ggc tgg agc tgc cgg gcc cgc aac ccc tgc aca       102
Asp Tyr Glu Gly Asp Gly Trp Ser Cys Arg Ala Arg Asn Pro Cys Thr
     10              15                  20

gat ggc cac cgc ggg ggc tgc agc gag cac gcc aac tgc ttg agc acc       150
Asp Gly His Arg Gly Gly Cys Ser Glu His Ala Asn Cys Leu Ser Thr
 25              30                  35                      40

ggc ctg aac aca cgg cgc tgt gag tgc cac gca ggc tac gta ggc gat       198
Gly Leu Asn Thr Arg Arg Cys Glu Cys His Ala Gly Tyr Val Gly Asp
                 45              50                  55

gga ctg cag tgt ctg gag gag tcg gaa cca cct gtg gac cgc tgc ttg       246
Gly Leu Gln Cys Leu Glu Glu Ser Glu Pro Pro Val Asp Arg Cys Leu
             60                  65                  70

ggc cag cca ccg ccc tgc cac tca gat gcc atg tgc act gac ctg cac       294
Gly Gln Pro Pro Pro Cys His Ser Asp Ala Met Cys Thr Asp Leu His
             75                  80                  85

ttc cag gag aaa cgg gct ggc gtt ttc cac ctc cag gcc acc agc ggc       342
Phe Gln Glu Lys Arg Ala Gly Val Phe His Leu Gln Ala Thr Ser Gly
     90                  95                  100

cct tat ggt ctg aac ttt tcg gag gct gag gcg gca tgc gaa gca cag       390
Pro Tyr Gly Leu Asn Phe Ser Glu Ala Glu Ala Ala Cys Glu Ala Gln
105                  110                  115                  120

gga gcc gtc ctt gct tca ttc cct cag ctc tct gct gcc cag cag ctg       438
Gly Ala Val Leu Ala Ser Phe Pro Gln Leu Ser Ala Ala Gln Gln Leu
                 125                  130                  135

ggc ttc cac ctg tgc ctc atg ggc tgg ctg gcc aat ggc tcc act gcc       486
Gly Phe His Leu Cys Leu Met Gly Trp Leu Ala Asn Gly Ser Thr Ala
             140                  145                  150

cac cct gtg gtt ttc cct gtg gcg gac tgt ggc aat ggt cgg gtg ggc       534
His Pro Val Val Phe Pro Val Ala Asp Cys Gly Asn Gly Arg Val Gly
             155                  160                  165

ata gtc agc ctg ggt gcc cgc aag aac ctc tca gaa cgc tgg gat gcc       582
Ile Val Ser Leu Gly Ala Arg Lys Asn Leu Ser Glu Arg Trp Asp Ala
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18

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tac tgc ttc cgt gtg caa gat gtg gcc tgc cga tgc cga aat ggc ttc    630
Tyr Cys Phe Arg Val Gln Asp Val Ala Cys Arg Cys Arg Asn Gly Phe
185             190             195             200

gtg ggt gac ggg atc agc acg tgc aat ggg aag ctg ctg gat gtg ctg    678
Val Gly Asp Gly Ile Ser Thr Cys Asn Gly Lys Leu Leu Asp Val Leu
            205             210             215

gct gcc act gcc aac ttc tcc acc ttc tat ggg atg cta ttg ggc tat    726
Ala Ala Thr Ala Asn Phe Ser Thr Phe Tyr Gly Met Leu Leu Gly Tyr
            220             225             230

gcc aat gcc acc cag cgg ggt ctc gac ttc ctg gac ttc ctg gat gat    774
Ala Asn Ala Thr Gln Arg Gly Leu Asp Phe Leu Asp Phe Leu Asp Asp
            235             240             245

gag ctc acg tat aag aca ctc ttc gtc cct gtc aat gaa ggc ttt gtg    822
Glu Leu Thr Tyr Lys Thr Leu Phe Val Pro Val Asn Glu Gly Phe Val
            250             255             260

gac aac atg acg ctg agt ggc cca aac ttg gag ctg cat gcc tcc aac    870
Asp Asn Met Thr Leu Ser Gly Pro Asn Leu Glu Leu His Ala Ser Asn
265             270             275             280

gcc acc ctc cta agt gcc aac gcc agc cag ggg aag ttg ctt ccg gcc    918
Ala Thr Leu Leu Ser Ala Asn Ala Ser Gln Gly Lys Leu Leu Pro Ala
            285             290             295

cac tca ggc ctc agc ctc atc atc agt gac gca ggc cct gac aac agt    966
His Ser Gly Leu Ser Leu Ile Ile Ser Asp Ala Gly Pro Asp Asn Ser
            300             305             310

tcc tgg gcc cct gtg gcc cca ggg aca gtt gtg gtt agc cgt atc att   1014
Ser Trp Ala Pro Val Ala Pro Gly Thr Val Val Val Ser Arg Ile Ile
            315             320             325

gtg tgg gac atc atg gcc ttc aat ggc atc atc cat gct ctg gcc agc   1062
Val Trp Asp Ile Met Ala Phe Asn Gly Ile Ile His Ala Leu Ala Ser
            330             335             340

ccc ctc ctg gca ccc cca cag ccc cag gca gtg ctg gcg cnt gaa gcc   1110
Pro Leu Leu Ala Pro Pro Gln Pro Gln Ala Val Leu Ala Xaa Glu Ala
345             350             355             360

cca cct gtg gcg gca ggc gtg ggg gct gtg ctt gcc gct gga gca ctg   1158
Pro Pro Val Ala Ala Gly Val Gly Ala Val Leu Ala Ala Gly Ala Leu
            365             370             375

ctt ggc ttg gtg gcc gga gct ctc tac ctc cgt gcc cga ggc aag ccc   1206
Leu Gly Leu Val Ala Gly Ala Leu Tyr Leu Arg Ala Arg Gly Lys Pro
            380             385             390

atg ggc ttt ggc ttc tct gcc ttc cag gcg gaa gat gat gct gat gac   1254
Met Gly Phe Gly Phe Ser Ala Phe Gln Ala Glu Asp Asp Ala Asp Asp
            395             400             405

gan ttc tca ccg tgg caa gaa ggg acc aac ccc acn ttg gtn tnt gtc   1302
Xaa Phe Ser Pro Trp Gln Glu Gly Thr Asn Pro Xaa Leu Xaa Xaa Val
            410             415             420

ccc aac cct gtc ttt ggc agc gac acc ttt tgt gaa ccc ttc gat gac   1350
Pro Asn Pro Val Phe Gly Ser Asp Thr Phe Cys Glu Pro Phe Asp Asp
425             430             435             440

tca ctg ctg gag gag gac ttc cct gac acc cag agg atc ctc aca gtc   1398
Ser Leu Leu Glu Glu Asp Phe Pro Asp Thr Gln Arg Ile Leu Thr Val
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aag tga cgaggctggg gctgaaagca gaagcatgca cagggaggag accantttta   1454
Lys

ttgcttgtct gggtggatgg ggcaggaggg nctgagggcc tgtcccagac aatannngtn 1514

ccctcgag   1522

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Cys Arg Ala Arg Asn Pro Cys Thr Asp Gly His Arg Gly Gly Cys Ser
              20   25   30

Glu His Ala Asn Cys Leu Ser Thr Gly Leu Asn Thr Arg Arg Cys Glu
          35   40   45

Cys His Ala Gly Tyr Val Gly Asp Gly Leu Gln Cys Leu Glu Glu Ser
      50   55   60

Glu Pro Pro Val Asp Arg Cys Leu Gly Gln Pro Pro Pro Cys His Ser
 65   70   75   80

Asp Ala Met Cys Thr Asp Leu His Phe Gln Glu Lys Arg Ala Gly Val
                  85   90   95

Phe His Leu Gln Ala Thr Ser Gly Pro Tyr Gly Leu Asn Phe Ser Glu
             100   105   110

Ala Glu Ala Ala Cys Glu Ala Gln Gly Ala Val Leu Ala Ser Phe Pro
         115   120   125

Gln Leu Ser Ala Ala Gln Gln Leu Gly Phe His Leu Cys Leu Met Gly
     130   135   140

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Trp Leu Ala Asn Gly Ser Thr Ala His Pro Val Val Phe Pro Val Ala
145             150             155             160

Asp Cys Gly Asn Gly Arg Val Gly Ile Val Ser Leu Gly Ala Arg Lys
            165             170             175

Asn Leu Ser Glu Arg Trp Asp Ala Tyr Cys Phe Arg Val Gln Asp Val
            180             185             190

Ala Cys Arg Cys Arg Asn Gly Phe Val Gly Asp Gly Ile Ser Thr Cys
        195             200             205

Asn Gly Lys Leu Leu Asp Val Leu Ala Ala Thr Ala Asn Phe Ser Thr
    210             215             220

Phe Tyr Gly Met Leu Leu Gly Tyr Ala Asn Ala Thr Gln Arg Gly Leu
225             230             235             240

Asp Phe Leu Asp Phe Leu Asp Asp Glu Leu Thr Tyr Lys Thr Leu Phe
            245             250             255

Val Pro Val Asn Glu Gly Phe Val Asp Asn Met Thr Leu Ser Gly Pro
            260             265             270

Asn Leu Glu Leu His Ala Ser Asn Ala Thr Leu Leu Ser Ala Asn Ala
        275             280             285

Ser Gln Gly Lys Leu Leu Pro Ala His Ser Gly Leu Ser Leu Ile Ile
    290             295             300

Ser Asp Ala Gly Pro Asp Asn Ser Ser Trp Ala Pro Val Ala Pro Gly
305             310             315             320

Thr Val Val Val Ser Arg Ile Ile Val Trp Asp Ile Met Ala Phe Asn
            325             330             335

Gly Ile Ile His Ala Leu Ala Ser Pro Leu Leu Ala Pro Pro Gln Pro
        340             345             350

Gln Ala Val Leu Ala Xaa Glu Ala Pro Pro Val Ala Ala Gly Val Gly
        355             360             365

Ala Val Leu Ala Ala Gly Ala Leu Leu Gly Leu Val Ala Gly Ala Leu
    370             375             380

Tyr Leu Arg Ala Arg Gly Lys Pro Met Gly Phe Gly Phe Ser Ala Phe
385             390             395             400

Gln Ala Glu Asp Asp Ala Asp Asp Xaa Phe Ser Pro Trp Gln Glu Gly
            405             410             415

Thr Asn Pro Xaa Leu Xaa Xaa Val Pro Asn Pro Val Phe Gly Ser Asp
            420             425             430

Thr Phe Cys Glu Pro Phe Asp Asp Ser Leu Leu Glu Glu Asp Phe Pro
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Asp Thr Gln Arg Ile Leu Thr Val Lys
    450             455


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<213> Homo sapiens

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Met Tyr Trp Asp Thr Gly Trp Gly Lys Asp Gly His Asn Ser Trp Arg
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21

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        1                 5                   10                  15

     Ala Ala Gly Val Tyr His Arg Ala Arg Ser Gly Lys Tyr Lys Thr Tyr
                 20                  25                  30

     Ala Ala Lys Ala Val Cys Gly Gly His Ala Thr Tyr Lys Ala Ala Arg
                 35                  40                  45

     Lys Gly His Val Cys Ala Ala Gly Trp Met Ala Lys Gly Arg Val Gly
             50                  55                  60

     Tyr Val Lys Gly Asn Cys Gly Gly Lys Thr Gly Asp Tyr Gly Arg Asn
     65                  70                  75                      80

     Arg Ser Arg Trp Asp Ala Tyr Cys Tyr Asn His Ala Lys Cys Gly Gly
                     85                  90                  95

     Val Thr Asp Lys Arg Lys Ser Gly Asn Tyr Asp Asn Cys Tyr Trp His
                 100                 105                 110

     Arg Lys Tyr Gly Arg His Ser Asp Asp Asp Asp Gly Cys Ala Asp Tyr
                 115                 120                 125

     Val Tyr Asp Ser Tyr Asp Asp Val His Gly Val Gly Arg Tyr Cys Gly
         130                 135                 140

     Asp Asp Asp Ser Thr Gly Asn Val Met Thr Lys Ser Asp Ala Ser Val
     145                 150                 155                 160

     Thr Ala Gly Gly Lys Tyr Val Ala Met Asp Val Ser Lys Ser Ser Gly
                 165                 170                 175

     Lys Asn Thr Ser Thr Thr Ser Thr Gly Asn Lys Asn Ala Gly Arg Ser
                 180                 185                 190

     His


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     <211> 985
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cctggggacg tttgccctgg ggccccagcc tggcccgggt caccctggca tgaggag   117

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atg ggc ctg ttg ctc ctg gtc cca ttg ctc ctg ctg ccc ggc tcc tac    165
Met Gly Leu Leu Leu Leu Val Pro Leu Leu Leu Leu Pro Gly Ser Tyr
 1               5                   10                  15

gga ctg ccc ttc tac tac ggc ttc tac tac tcc aac agc gcc aac gac    213
Gly Leu Pro Phe Tyr Tyr Gly Phe Tyr Tyr Ser Asn Ser Ala Asn Asp
            20                  25                  30

cag aac cta ggc aac ggt cat ggc aaa gac cta cnt aat gga gtg aag    261
Gln Asn Leu Gly Asn Gly His Gly Lys Asp Leu Xaa Asn Gly Val Lys
        35                  40                  45

ctg gtg gtg gag aca ccc gag gag acc ctg ttc acc tac caa ggg gcc    309
Leu Val Val Glu Thr Pro Glu Glu Thr Leu Phe Thr Tyr Gln Gly Ala
    50                  55                  60

agt gtg atc ctg ccc tgc cgc tac cgc tac gag ccg gcc ctg gtc tcc    357
Ser Val Ile Leu Pro Cys Arg Tyr Arg Tyr Glu Pro Ala Leu Val Ser
65                  70                  75                  80

ccg cgg cgt gtg cgt gtc aaa tgg tgg aag ctg tcg gag aac ggg gcc    405
Pro Arg Arg Val Arg Val Lys Trp Trp Lys Leu Ser Glu Asn Gly Ala
                85                  90                  95

cca gag aag gac gtg ctg gtg gcc atc ggg ctg agg cac cgc tcc ttt    453
Pro Glu Lys Asp Val Leu Val Ala Ile Gly Leu Arg His Arg Ser Phe
            100                 105                 110

ggg gac tac caa ggc cgc gtg cac ctg cgg cag gac aaa gag cat gac    501
Gly Asp Tyr Gln Gly Arg Val His Leu Arg Gln Asp Lys Glu His Asp
        115                 120                 125

gtc tcg ntg gag atc cag gnt ctg cgg ctg gag gac tat ggg cgt tac    549
Val Ser Xaa Glu Ile Gln Xaa Leu Arg Leu Glu Asp Tyr Gly Arg Tyr
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23

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                130                    135                   140

cgc tgt gag gtc atn gac ggg ctg gag gat gaa agc ggt ctg gtg gag    597
Arg Cys Glu Val Xaa Asp Gly Leu Glu Asp Glu Ser Gly Leu Val Glu
145                 150                 155                 160

ctg gag ctg cgg ggt gtg gtc ttt cct tac cag tcc ccc aac ggg cgc    645
Leu Glu Leu Arg Gly Val Val Phe Pro Tyr Gln Ser Pro Asn Gly Arg
                165                 170                 175

tac cag ttc aac ttc cac gag ggc cag cag gtc tgt gca gag cag gct    693
Tyr Gln Phe Asn Phe His Glu Gly Gln Gln Val Cys Ala Glu Gln Ala
                180                 185                 190

gcg gtg gtg gcc tcc ttt gag cag ctc ttc cgg gcc tgg gag gag ggc    741
Ala Val Val Ala Ser Phe Glu Gln Leu Phe Arg Ala Trp Glu Glu Gly
                195                 200                 205

ctg gac tgg tgc aac gcg ggc tgg ctg cag gat gcc acg gtg cag tac    789
Leu Asp Trp Cys Asn Ala Gly Trp Leu Gln Asp Ala Thr Val Gln Tyr
210                 215                 220

ccc atc atg ttg ccc cgg cag ccc tgc ggt ggc ccg gac ctg gca cct    837
Pro Ile Met Leu Pro Arg Gln Pro Cys Gly Gly Pro Asp Leu Ala Pro
225                 230                 235                 240

ggc gtg cga agc tac ggc ccc cgc cac cgc cgc ctg cac cgc tat gat    885
Gly Val Arg Ser Tyr Gly Pro Arg His Arg Arg Leu His Arg Tyr Asp
                245                 250                 255

gta ttc tgc ttc gct act gcc ctc arg ggg cgg gtg tac tac ctg gan    933
Val Phe Cys Phe Ala Thr Ala Leu Xaa Gly Arg Val Tyr Tyr Leu Xaa
                260                 265                 270

cac cct gag aan ctg acn ctg aca naa gca agg gaa gcc tgc caa gaa    981
His Pro Glu Xaa Leu Xaa Leu Thr Xaa Ala Arg Glu Ala Cys Gln Glu
        275                 280                 285

aaa t                                                              985
Lys


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Gly Leu Pro Phe Tyr Tyr Gly Phe Tyr Tyr Ser Asn Ser Ala Asn Asp
          20   25   30

Gln Asn Leu Gly Asn Gly His Gly Lys Asp Leu Xaa Asn Gly Val Lys
         35   40   45

Leu Val Val Glu Thr Pro Glu Glu Thr Leu Phe Thr Tyr Gln Gly Ala
    50   55   60

Ser Val Ile Leu Pro Cys Arg Tyr Arg Tyr Glu Pro Ala Leu Val Ser
65   70   75   80

Pro Arg Arg Val Arg Val Lys Trp Trp Lys Leu Ser Glu Asn Gly Ala
             85   90   95

Pro Glu Lys Asp Val Leu Val Ala Ile Gly Leu Arg His Arg Ser Phe
         100   105   110

Gly Asp Tyr Gln Gly Arg Val His Leu Arg Gln Asp Lys Glu His Asp
         115   120   125

Val Ser Xaa Glu Ile Gln Xaa Leu Arg Leu Glu Asp Tyr Gly Arg Tyr
    130   135   140

Arg Cys Glu Val Xaa Asp Gly Leu Glu Asp Glu Ser Gly Leu Val Glu
145   150   155   160

Leu Glu Leu Arg Gly Val Val Phe Pro Tyr Gln Ser Pro Asn Gly Arg
             165   170   175

Tyr Gln Phe Asn Phe His Glu Gly Gln Gln Val Cys Ala Glu Gln Ala
         180   185   190

Ala Val Val Ala Ser Phe Glu Gln Leu Phe Arg Ala Trp Glu Glu Gly
         195   200   205

Leu Asp Trp Cys Asn Ala Gly Trp Leu Gln Asp Ala Thr Val Gln Tyr
    210   215   220

Pro Ile Met Leu Pro Arg Gln Pro Cys Gly Gly Pro Asp Leu Ala Pro

Gly Val Arg Ser Tyr Gly Pro Arg His Arg Arg Leu His Arg Tyr Asp
            245   250   255

Val Phe Cys Phe Ala Thr Ala Leu Xaa Gly Arg Val Tyr Tyr Leu Xaa
            260   265   270

His Pro Glu Xaa Leu Xaa Leu Thr Xaa Ala Arg Glu Ala Cys Gln Glu
            275   280   285

Lys

<210> 9
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<212> PRT
<213> Homo sapiens

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  1   5   10   15

Pro His Pro Asp Asn Ser Ser Leu Glu His Glu Arg Ile Ile His Ile
            20   25   30

Gln Glu Glu Asn Gly Pro Arg Leu Leu Val Val Ala Glu Gln Ala Lys
        35   40   45

Ile Phe Ser Gln Arg Gly Gly Asn Val Thr Leu Pro Cys Lys Phe Tyr
        50   55   60

His Glu His Thr Ser Thr Ala Gly Ser Gly Thr His Lys Ile Arg Val
 65   70   75   80

Lys Trp Thr Lys Leu Thr Ser Asp Tyr Leu Lys Glu Val Asp Val Phe
                85   90   95

Val Ala Met Gly His His Arg Lys Ser Tyr Gly Lys Tyr Gln Gly Arg
            100   105   110

Val Phe Leu Arg Glu Ser Ser Glu Asn Asp Ala Ser Leu Ile Ile Thr
            115   120   125

Asn Ile Met Leu Glu Asp Tyr Gly Arg Tyr Lys Cys Glu Val Ile Glu
        130   135   140

Gly Leu Glu Asp Asp Thr Ala Val Val Ala Leu Asn Leu Glu Gly Val
145   150   155   160

Val Phe Pro Tyr Ser Pro Arg Leu Gly Arg Tyr Asn Leu Asn Phe His
            165   170   175

Glu Ala Gln Gln Ala Cys Leu Asp Gln Asp Ser Ile Ile Ala Ser Phe
            180   185   190

Asp Gln Leu Tyr Glu Ala Trp Arg Ser Gly Leu Asp Trp Cys Asn Ala
            195   200   205

Gly Trp Leu Ser Asp Gly Ser Val Gln Tyr Pro Ile Thr Lys Pro Arg
        210   215   220

Glu Pro Cys Gly Gly Lys Asn Thr Val Pro Gly Val Arg Asn Tyr Gly
225   230   235   240

Phe Trp Asp Lys Glu Arg Ser Arg Tyr Asp Val Phe Cys Phe Thr Ser
            245   250   255

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Asn Phe Asn Gly Arg Phe Tyr Tyr Leu Ile His Pro Thr Lys Leu Thr
            260             265             270

Tyr Asp Glu Ala Val Gln Ala Cys Leu Lys Asp Gly Ala Gln Ile Ala
            275             280             285

Lys Val Gly Gln Ile Phe Ala Ala Trp Lys Leu Leu Gly Tyr Asp Arg
        290             295             300

Cys Asp Ala Gly Trp Leu Ala Asp Gly Ser Val Arg Tyr Pro Ile Ser
305                 310             315                 320

Arg Pro Arg Lys Arg Cys Ser Pro Asn Glu Ala Ala Val Arg Phe Val
                325             330             335

Gly Phe Pro Asp Lys Lys His Lys Leu Tyr Gly Val Tyr Cys Phe Arg
            340             345             350

Ala Tyr Asn
        355

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gccagatgct cccagaaggg cacgaaggtc tcctgcagct gccagaaggg atacaaaggg 120

gacgggcaca gctgcacaga gatagacccc tgtgcagacg gccttaacgg agggtgtcac 180

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gagcacgcca cctgtaag atg aca ggc ccg ggc aag cac aag tgt gag tgt    231
                    Met Thr Gly Pro Gly Lys His Lys Cys Glu Cys
                     1               5                      10

aaa agt cac tat gtc gga gat ggg ctg aac tgt gag ccg gag cag ctg    279
Lys Ser His Tyr Val Gly Asp Gly Leu Asn Cys Glu Pro Glu Gln Leu
            15                  20                  25

ccc att gac cgc tgc tta cag gac aat ggg cag tgc cat gca gac gcc    327
Pro Ile Asp Arg Cys Leu Gln Asp Asn Gly Gln Cys His Ala Asp Ala
        30                  35                  40

aaa tgt gtc gac ctc cac ttc cag gat acc act gtt ggg gtg ttc cat    375
Lys Cys Val Asp Leu His Phe Gln Asp Thr Thr Val Gly Val Phe His
    45                  50                  55

cta cgc tcc cca ctg ggc cag tat aag ctg acc ttt gac aaa gcc aga    423
Leu Arg Ser Pro Leu Gly Gln Tyr Lys Leu Thr Phe Asp Lys Ala Arg
60                  65                  70                  75

gag gcc tgt gcc aac gaa gct gcg acc atg gca acc tac aac cag ctc    471
Glu Ala Cys Ala Asn Glu Ala Ala Thr Met Ala Thr Tyr Asn Gln Leu
                80                  85                  90

tcc tat nnc cag aag gcc aag tac cac ctg tgc tca gca ggc tgg ctg    519
Ser Tyr Xaa Gln Lys Ala Lys Tyr His Leu Cys Ser Ala Gly Trp Leu
                95                  100                 105

gag acc ggg cgg gtt gcc tac ccc aca gcc ttc gcc tcc cag aac tgt    567
Glu Thr Gly Arg Val Ala Tyr Pro Thr Ala Phe Ala Ser Gln Asn Cys
            110                 115                 120

ggc tct ggt gtg gtt ggg ata gtg gac tat gga cct aga ccc aac aag    615
Gly Ser Gly Val Val Gly Ile Val Asp Tyr Gly Pro Arg Pro Asn Lys
        125                 130                 135

agt gaa atg tgg gat gtc ttc tgc tat cgg atg aaa gat gtg aac tgc    663
Ser Glu Met Trp Asp Val Phe Cys Tyr Arg Met Lys Asp Val Asn Cys
140                 145                 150                 155

acc tnc aag gtg ggc tat gtg gga gat ggc ttc tca tac agt ggg aac    711
Thr Xaa Lys Val Gly Tyr Val Gly Asp Gly Phe Ser Tyr Ser Gly Asn
                160                 165                 170

ctg ctg cag gtc ctg atg tcc ttc ccc tca ctc aca aac ttc ctg acg    759
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28

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Leu Leu Gln Val Leu Met Ser Phe Pro Ser Leu Thr Asn Phe Leu Thr
            175                 180                 185

gaa gtg ctg gcc tat tcc aac agc tca gct cga ggc cgt gca ttt cta    807
Glu Val Leu Ala Tyr Ser Asn Ser Ser Ala Arg Gly Arg Ala Phe Leu
            190                 195                 200

gaa cac ctg act gac ctg tcc atc cgc ggc acc ctc ttt gtn cca cag    855
Glu His Leu Thr Asp Leu Ser Ile Arg Gly Thr Leu Phe Val Pro Gln
            205                 210                 215

aac agt ggg ctg ggg gag aat gag acc ttg tct ggg cgg gac atc gag    903
Asn Ser Gly Leu Gly Glu Asn Glu Thr Leu Ser Gly Arg Asp Ile Glu
220                 225                 230                 235

cac cac ctc gcc aat gtc agc atg ttt ttc tac aat gac ctt gtc aat    951
His His Leu Ala Asn Val Ser Met Phe Phe Tyr Asn Asp Leu Val Asn
            240                 245                 250

ggc acc acc ctg caa acg agg ctg gga agc aag ctg ctc atc act gac    999
Gly Thr Thr Leu Gln Thr Arg Leu Gly Ser Lys Leu Leu Ile Thr Asp
            255                 260                 265

aga cag gac cca ctc cac ccg acg gag acc agg tgt gtt gat gga aga    1047
Arg Gln Asp Pro Leu His Pro Thr Glu Thr Arg Cys Val Asp Gly Arg
            270                 275                 280

gac act ctg gag tgg gac atc tgt gcc tcc aat ggg atc aca cat gtc    1095
Asp Thr Leu Glu Trp Asp Ile Cys Ala Ser Asn Gly Ile Thr His Val
            285                 290                 295

att tcc agg yct tta aaa gca ccc cct gcc ccc gtg acc ttg ncc cac    1143
Ile Ser Arg Xaa Leu Lys Ala Pro Pro Ala Pro Val Thr Leu Xaa His
300                 305                 310                 315

act ggn ttg gga gna ggg atc ttc tnt gnc atc atc ctg gtg act ggg    1191
Thr Gly Leu Gly Xaa Gly Ile Phe Xaa Xaa Ile Ile Leu Val Thr Gly
            320                 325                 330

gct gtt gcc ttg gct gct tac tcc tac ttt cgg ata aac cgg aaa aca    1239
Ala Val Ala Leu Ala Ala Tyr Ser Tyr Phe Arg Ile Asn Arg Lys Thr
            335                 340                 345

atc ggc ttc can cat ttt ga                                         1259
Ile Gly Phe Xaa His Phe
            350
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29

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<223> Xaa equals any of the naturally occurring L-amino acids

<220>
<221> MISC_FEATURE
<222> (320)
<223> Xaa equals any of the naturally occurring L-amino acids

<220>
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<223> Xaa equals any of the naturally occurring L-amino acids

<220>
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<223> Xaa equals any of the naturally occurring L-amino acids

<220>
<221> MISC_FEATURE
<222> (351)
<223> Xaa equals any of the naturally occurring L-amino acids

<400> 11
Met Thr Gly Pro Gly Lys His Lys Cys Glu Cys Lys Ser His Tyr Val
 1   5   10   15

Gly Asp Gly Leu Asn Cys Glu Pro Glu Gln Leu Pro Ile Asp Arg Cys
                20   25   30

Leu Gln Asp Asn Gly Gln Cys His Ala Asp Ala Lys Cys Val Asp Leu
            35   40   45

His Phe Gln Asp Thr Thr Val Gly Val Phe His Leu Arg Ser Pro Leu
        50   55   60

Gly Gln Tyr Lys Leu Thr Phe Asp Lys Ala Arg Glu Ala Cys Ala Asn
65   70   75   80

Glu Ala Ala Thr Met Ala Thr Tyr Asn Gln Leu Ser Tyr Xaa Gln Lys
                85   90   95

Ala Lys Tyr His Leu Cys Ser Ala Gly Trp Leu Glu Thr Gly Arg Val
            100   105   110

Ala Tyr Pro Thr Ala Phe Ala Ser Gln Asn Cys Gly Ser Gly Val Val
            115   120   125

Gly Ile Val Asp Tyr Gly Pro Arg Pro Asn Lys Ser Glu Met Trp Asp
        130   135   140

Val Phe Cys Tyr Arg Met Lys Asp Val Asn Cys Thr Xaa Lys Val Gly
145   150   155   160

Tyr Val Gly Asp Gly Phe Ser Tyr Ser Gly Asn Leu Leu Gln Val Leu
                165   170   175

Met Ser Phe Pro Ser Leu Thr Asn Phe Leu Thr Glu Val Leu Ala Tyr
            180   185   190

Ser Asn Ser Ser Ala Arg Gly Arg Ala Phe Leu Glu His Leu Thr Asp
            195   200   205

Leu Ser Ile Arg Gly Thr Leu Phe Val Pro Gln Asn Ser Gly Leu Gly
        210   215   220

30

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Glu Asn Glu Thr Leu Ser Gly Arg Asp Ile Glu His His Leu Ala Asn
225                 230             235                     240

Val Ser Met Phe Phe Tyr Asn Asp Leu Val Asn Gly Thr Thr Leu Gln
            245                 250                 255

Thr Arg Leu Gly Ser Lys Leu Leu Ile Thr Asp Arg Gln Asp Pro Leu
            260                 265                 270

His Pro Thr Glu Thr Arg Cys Val Asp Gly Arg Asp Thr Leu Glu Trp
            275                 280                 285

Asp Ile Cys Ala Ser Asn Gly Ile Thr His Val Ile Ser Arg Xaa Leu
            290                 295                 300

Lys Ala Pro Pro Ala Pro Val Thr Leu Xaa His Thr Gly Leu Gly Xaa
305                 310                 315                     320

Gly Ile Phe Xaa Xaa Ile Ile Leu Val Thr Gly Ala Val Ala Leu Ala
                325                 330                 335

Ala Tyr Ser Tyr Phe Arg Ile Asn Arg Lys Thr Ile Gly Phe Xaa His
            340                 345                 350

Phe

<210> 12
<211> 275
<212> PRT
<213> Mus musculus

<400> 12
Met Val Val Leu Leu Cys Leu Cys Val Leu Leu Trp Glu Glu Ala His
  1             5                 10                      15

Gly Trp Gly Phe Lys Asn Gly Ile Phe His Asn Ser Ile Trp Leu Glu
            20                  25                  30

Gln Ala Ala Gly Val Tyr His Arg Glu Ala Arg Ala Gly Arg Tyr Lys
            35                  40                  45

Leu Thr Tyr Ala Glu Ala Lys Ala Val Cys Glu Phe Glu Gly Gly Arg
        50                  55                  60

Leu Ala Thr Tyr Lys Gln Leu Glu Ala Ala Arg Lys Ile Gly Phe His
65                  70                  75                      80

Val Cys Ala Ala Gly Trp Met Ala Lys Gly Arg Val Gly Tyr Pro Ile
                85                  90                  95

Val Lys Pro Gly Pro Asn Cys Gly Phe Gly Lys Thr Gly Ile Ile Asp
            100                 105                 110

Tyr Gly Ile Arg Leu Asn Arg Ser Glu Arg Trp Asp Ala Tyr Cys Tyr
            115                 120                 125

Asn Pro His Ala Lys Glu Cys Gly Gly Val Phe Thr Asp Pro Lys Arg
            130                 135                 140

Ile Phe Lys Ser Pro Gly Phe Pro Asn Glu Tyr Asp Asp Asn Gln Val
145                 150                 155                     160

Cys Tyr Trp His Ile Arg Leu Lys Tyr Gly Gln Arg Ile His Leu Ser
                165                 170                 175

Phe Leu Asp Phe Asp Leu Glu His Asp Pro Gly Cys Leu Ala Asp Tyr
            180                 185                 190
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31

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Val Glu Ile Tyr Asp Ser Tyr Asp Asp Val His Gly Phe Val Gly Arg
        195             200             205

Tyr Cys Gly Asp Glu Leu Pro Glu Asp Ile Ile Ser Thr Gly Asn Val
        210             215             220

Met Thr Leu Lys Phe Leu Ser Asp Ala Ser Val Thr Ala Gly Gly Phe
225             230             235             240

Gln Ile Lys Tyr Val Thr Val Asp Pro Ala Ser Lys Ser Ser Gln Ala
            245             250             255

Lys Asn Thr Ser Thr Thr Gly Asn Lys Lys Phe Leu Pro Gly Arg Phe
            260             265             270

Ser His Leu
        275


<210> 13
<211> 44
<212> DNA
<213> artificial sequence

<220>
<223> contains an EcoRI restriction site

<400> 13
gcagcaggat ccatgatgga ccagggctgc cgggaaatcc ttac                    44


<210> 14
<211> 44
<212> DNA
<213> artificial sequence

<220>
<223> contains a XhoI restriction site

<400> 14
gcagcatcta gatcacttga ctgtgaggat cctctgggtg tcag                    44


<210> 15
<211> 45
<212> DNA
<213> artificial sequence

<220>
<223> contains an EcoRI restriction site

<400> 15
gcagcaggat ccatggtcac ttgtacctgc ctgcccgact acgag                   45


<210> 16
<211> 45
<212> DNA
<213> artificial sequence

<220>
<223> contains a XhoI restriction site

<400> 16
gcagcaggat ccatggtcac ttgtacctgc ctgcccgact acgag                   45
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<210> 17
<211> 48
<212> DNA
<213> artificial sequence

<220>
<223> contains an EcoRI restriction site

<400> 17
gcagcaggat ccatgggcct gttgctcctg gtcccattgc tcctgctg                48


<210> 18
<211> 46
<212> DNA
<213> artificial sequence

<220>
<221> misc_feature
<222> (40)
<223> n equals a, t, g or c

<220>
<223> contains a XhoI restriction site

<400> 18
gcagcatcta gaatttttct tggcaggctt cccttgcttn tgtcag                 46

<210> 19
<211> 44
<212> DNA
<213> artificial sequence

<220>
<223> contains an EcoRI restriction site

<400> 19
gcagcaggat ccatgacagg cccgggcaag cacaagtgtg agtg                   44


<210> 20
<211> 49
<212> DNA
<213> artificial sequence

<220>
<221> misc_feature
<222> (21)
<223> n equals a, t, g or c

<220>
<223> contains a XhoI restriction site

<400> 20
gcagcatcta gatcaaaatg ntggaagccg attgttttcc ggtttatcc             49


<210> 21
<211> 50
<212> DNA
<213> artificial sequence

<220>
<223> contains a BglII restriction site

<400> 21
gcagcaagat ctgccatcat gatggaccag ggctgccggg aaatccttac            50
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<210> 22
<211> 45
<212> DNA
<213> artificial sequence

<220>
<223> contains a XbaI restriction site

<400> 22
gcagcatcta gatcacttga ctgtgaggat cctctgggtg tcagg                45


<210> 23
<211> 51
<212> DNA
<213> artificial sequence

<220>
<223> contains a BglII restriction site

<400> 23
gcagcaagat ctgccatcat ggtcacttgt acctgcctgc ccgactacga g         51


<210> 24
<211> 45
<212> DNA
<213> artificial sequence

<220>
<223> contains an XbaI restriction site

<400> 24
gcagcatcta gatcacttga ctgtgaggat cctctgggtg tcagg                45


<210> 25
<211> 54
<212> DNA
<213> artificial sequence

<220>
<223> contains a BglII restriction site

<400> 25
gcagcaagat ctgccatcat gggcctgttg ctcctggtcc cattgctcct gctg       54


<210> 26
<211> 46
<212> DNA
<213> artificial sequence

<220>
<221> misc_feature
<222> (40)
<223> n equals a, t, g or c

<220>
<223> contains an XbaI restriction site

<400> 26
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<210> 27
<211> 50
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34

<212> DNA
<213> artificial sequence

<220>
<223> contains a BglII restriction site

<400> 27
gcagcaagat ctgccatcat gacaggcccg ggcaagcaca agtgtgagtg   50

<210> 28
<211> 49
<212> DNA
<213> artificial sequence

<220>
<221> misc_feature
<222> (21)
<223> n equals a,t,g, or c

<220>
<223> contains a XbaI restriction site

<400> 28
gcagcatcta gatcaaaatg ntggaagccg attgttttcc ggtttatcc   49

<210> 29
<211> 50
<212> DNA
<213> artificial sequence

<220>
<223> contains a BamHI restriction site

<400> 29
gcagcaagat ctgccatcat gatggaccag ggctgccggg aaatccttac   50

<210> 30
<211> 44
<212> DNA
<213> artificial sequence

<220>
<223> contains an XbaI restriction site

<400> 30
gcagcatcta gatcacttga ctgtgaggat cctctgggtg tcag   44

<210> 31
<211> 54
<212> DNA
<213> artificial sequence

<220>
<223> contains a BamHI restriction site

<400> 31
gcagcaagat ctgccatcat gatggtcact tgtacctgcc tgcccgacta cgag   54

<210> 32
<211> 45
<212> DNA
<213> artificial sequence

<220>
<223> contains an XbaI restriction site

<400> 32
gcagcatcta gatcacttga ctgtgaggat cctctgggtg tcagg   45

<210> 33
<211> 54
<212> DNA
<213> artificial sequence

<220>
<223> contains a BamHI restriction site

<400> 33
gcagcaagat ctgccatcat gggcctgttg ctcctggtcc cattgctcct gctg   54

<210> 34
<211> 46
<212> DNA
<213> artificial sequence

<220>
<221> misc_feature
<222> (40)
<223> n equals a, t, g or c

<220>
<223> contains an XbaI restriction site

<400> 34
gcagcatcta gaatttttct tggcaggctt cccttgcttn tgtcag   46

<210> 35
<211> 50
<212> DNA
<213> artificial sequence

<220>
<223> contains a BamHI restriction site

<400> 35
gcagcaagat ctgccatcat gacaggcccg ggcaagcaca agtgtgagtg   50

<210> 36
<211> 49
<212> DNA
<213> artificial sequence

<220>
<221> misc_feature
<222> (21)
<223> n equals a, t, g or c

<220>
<223> contains an XbaI restriction site

<400> 36
gcagcatcta gatcaaaatg ntggaagccg attgttttcc ggtttatcc   49

<210> 37
<211> 733
<212> DNA

36

<213> Homo sapiens

<400> 37
gggatccgga gcccaaatct tctgacaaaa ctcacacatg cccaccgtgc ccagcacctg 60
aattcgaggg tgcaccgtca gtcttcctct tccccccaaa acccaaggac accctcatga 120
tctcccggac tcctgaggtc acatgcgtgg tggtggacgt aagccacgaa gaccctgagg 180
tcaagttcaa ctggtacgtg gacggcgtgg aggtgcataa tgccaagaca aagccgcggg 240
aggagcagta caacagcacg taccgtgtgg tcagcgtcct caccgtcctg caccaggact 300
ggctgaatgg caaggagtac aagtgcaagg tctccaacaa agccctccca acccccatcg 360
agaaaaccat ctccaaagcc aaagggcagc cccgagaacc acaggtgtac accctgcccc 420
catcccggga tgagctgacc aagaaccagg tcagcctgac ctgcctggtc aaaggcttct 480
atccaagcga catcgccgtg gagtgggaga gcaatgggca gccggagaac aactacaaga 540
ccacgcctcc cgtgctggac tccgacggct ccttcttcct ctacagcaag ctcaccgtgg 600
acaagagcag gtggcagcag gggaacgtct tctcatgctc cgtgatgcat gaggctctgc 660
acaaccacta cacgcagaag agcctctccc tgtctccggg taaatgagtg cgacggccgc 720
gactctagag gat 733